

Fig 1

Cross section of surface-micromachined high-pressure sensor

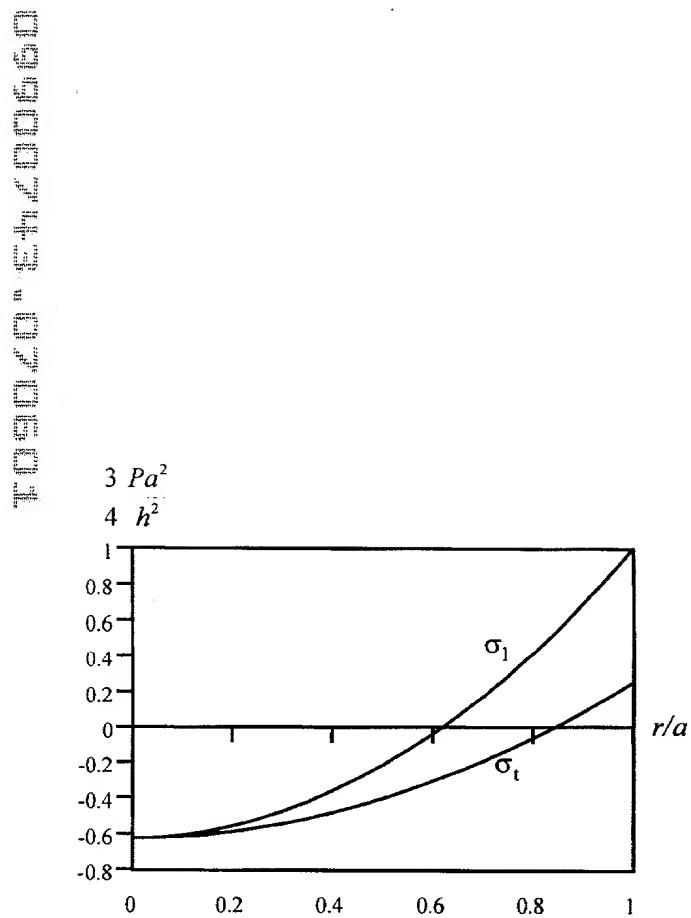
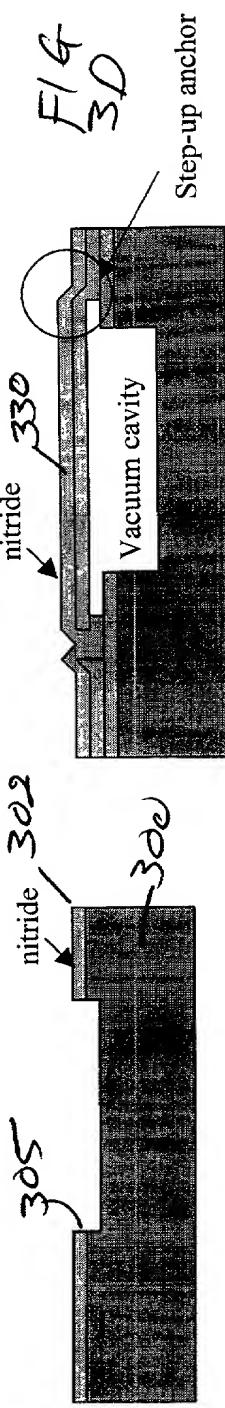
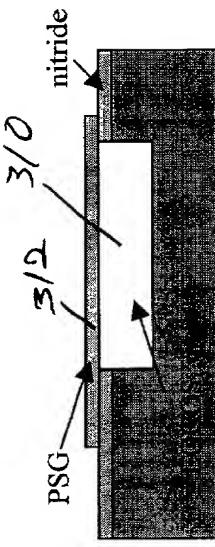


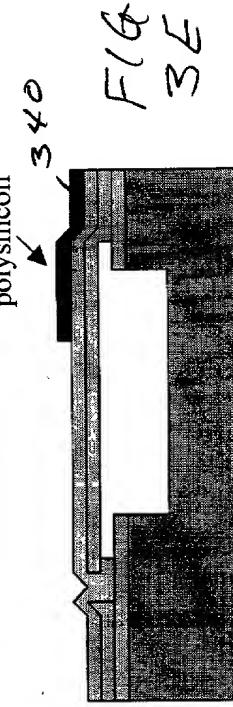
Figure 2 Longitudinal and transverse stress distribution along radius of a circular diaphragm.



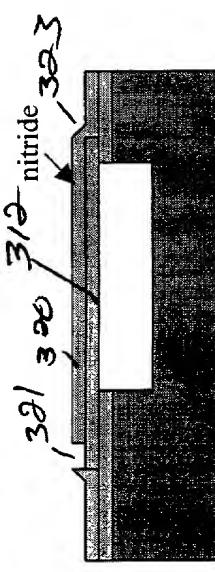
1. Deposit and pattern nitride.



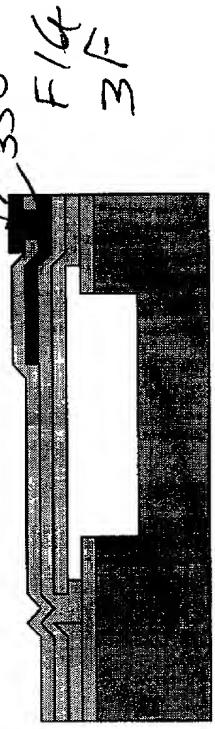
4. Remove oxide and PSG by 48%HF.  
Deposit nitride



2. Local oxidation. Deposit and pattern phosphosilicate glass(PSG).



5. Deposit, dope and pattern polysilicon.



3. Deposit nitride and open etching holes.

6. Deposit nitride as passivation layer and Al metallization.

Fig 4

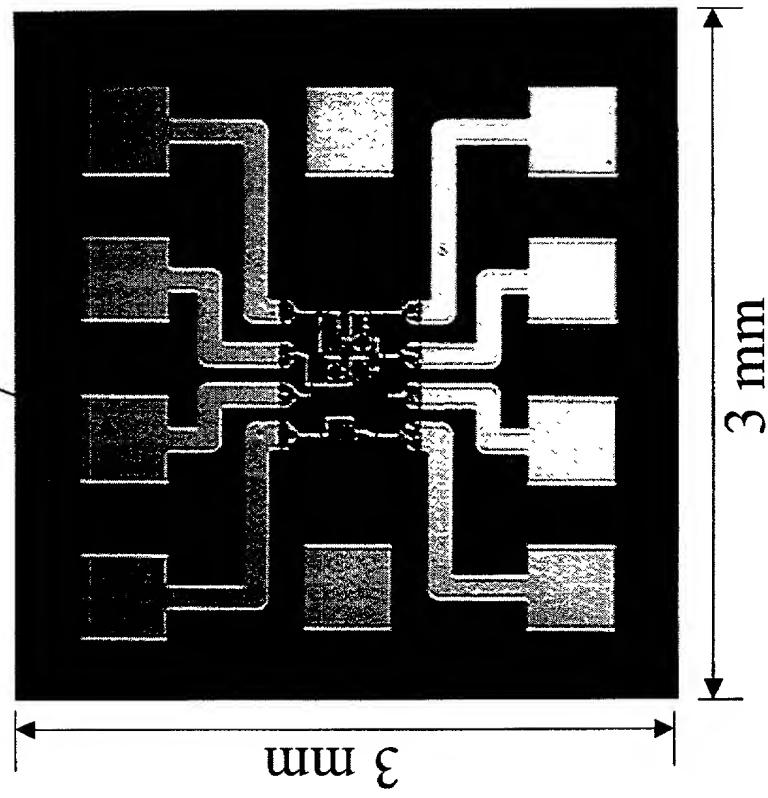
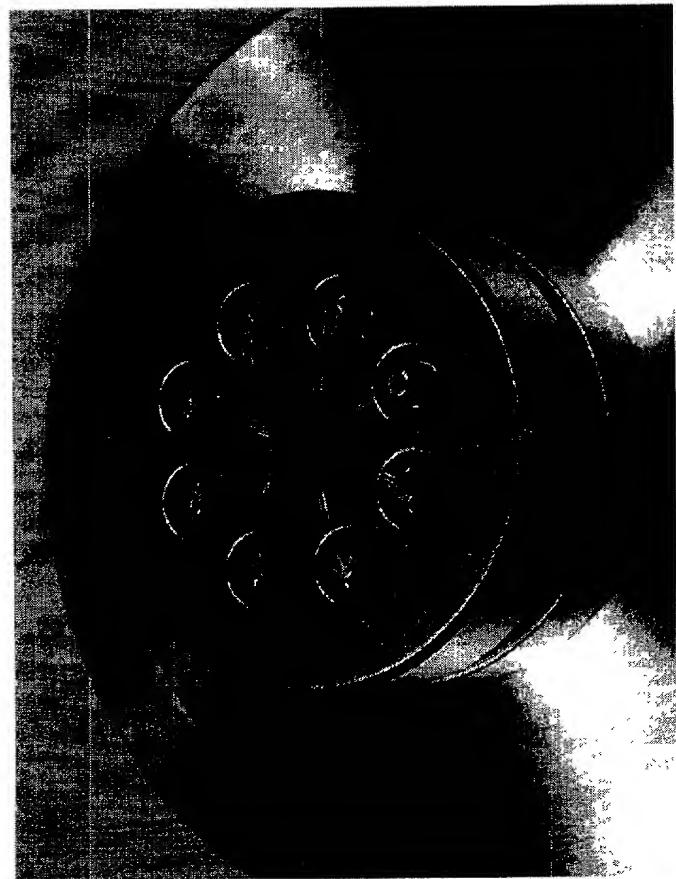


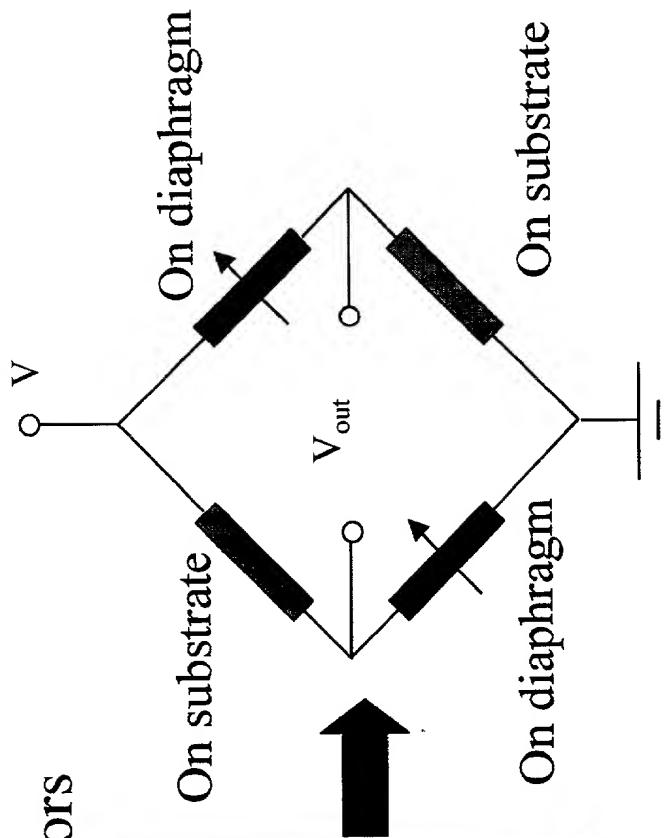
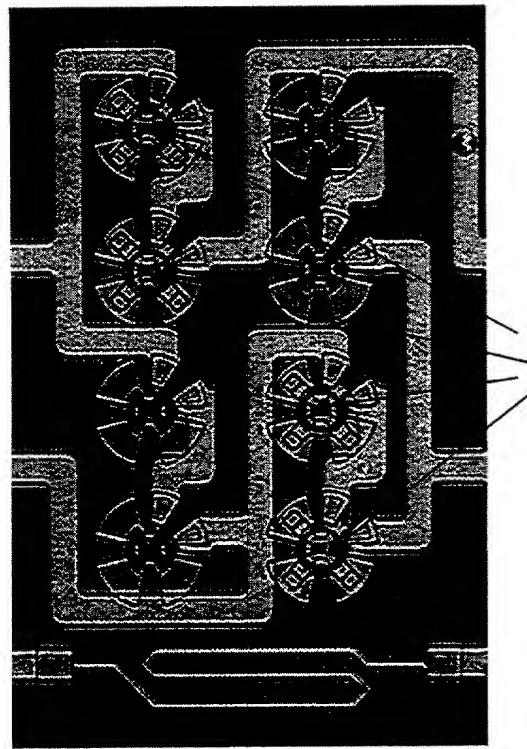
Fig 5



Diced sensor chip

Chip wire-bonded to metal header

Polysilicon  
thermistor  
Pressure sensor:  
8 polysilicon resistors



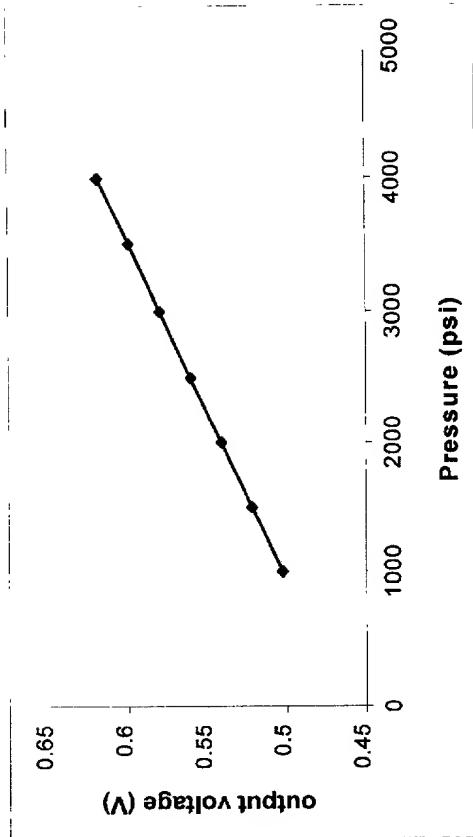
4 nitride Diaphragms

Wheatstone bridge

Multi-diaphragm configuration:

- minimize self-heating effect
- make layout much easier

FIG 6



Calibration curve of the sensor ( $T = 40^\circ\text{C}$ )

Fig 7

Step-up anchor: caused by  
the edge of sacrificial layer  
(PSG)  $800$   
Crack

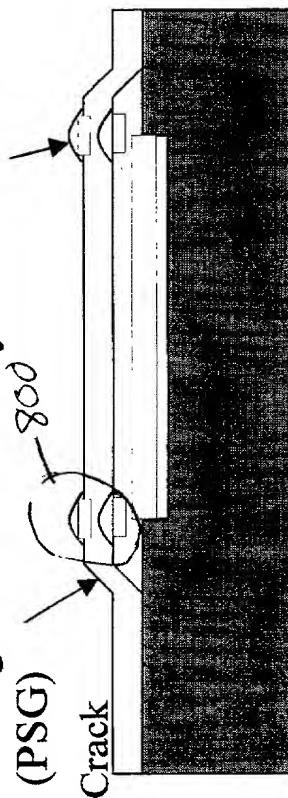


FIG 8

Cross section of sensor diaphragm

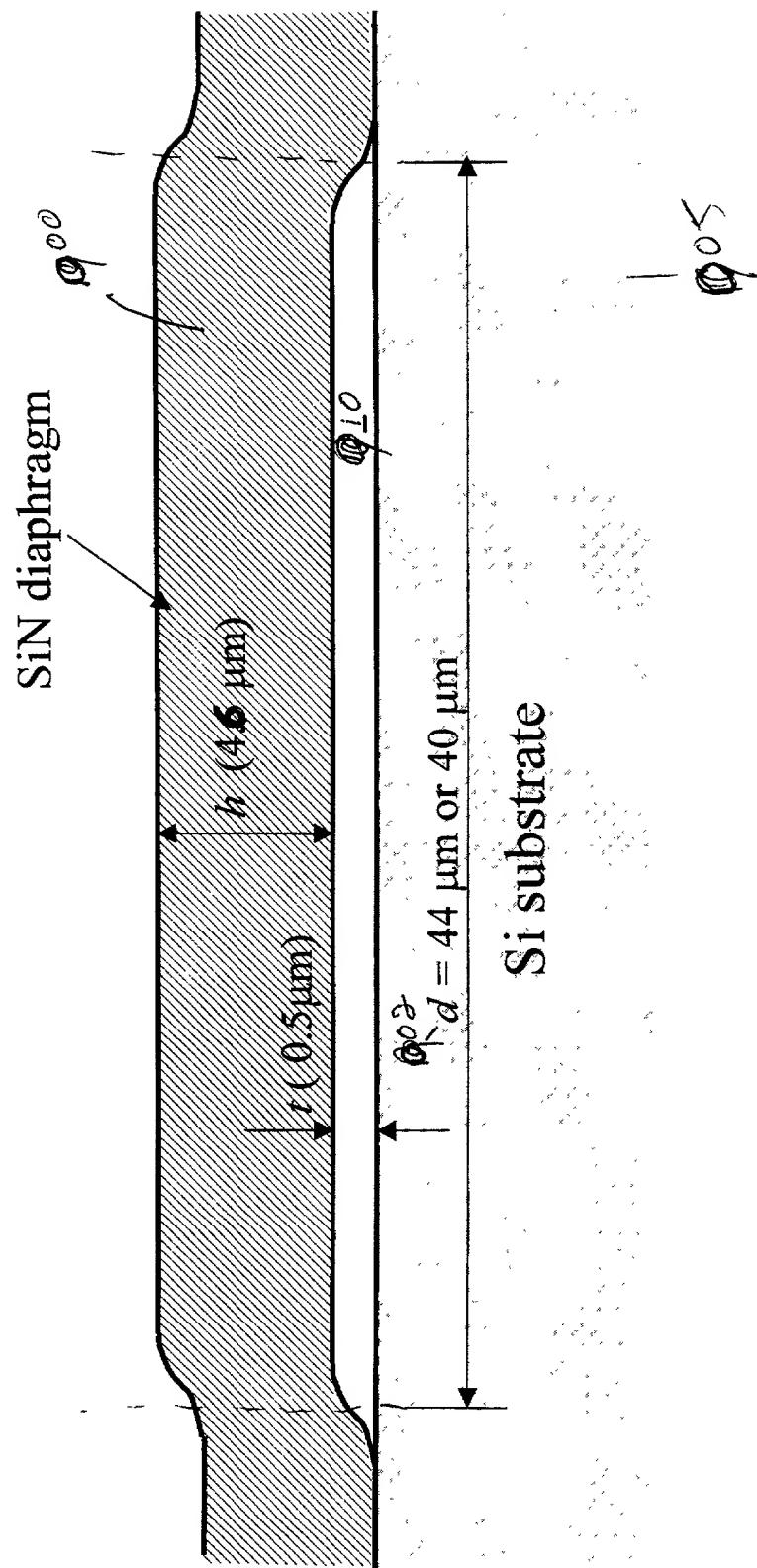
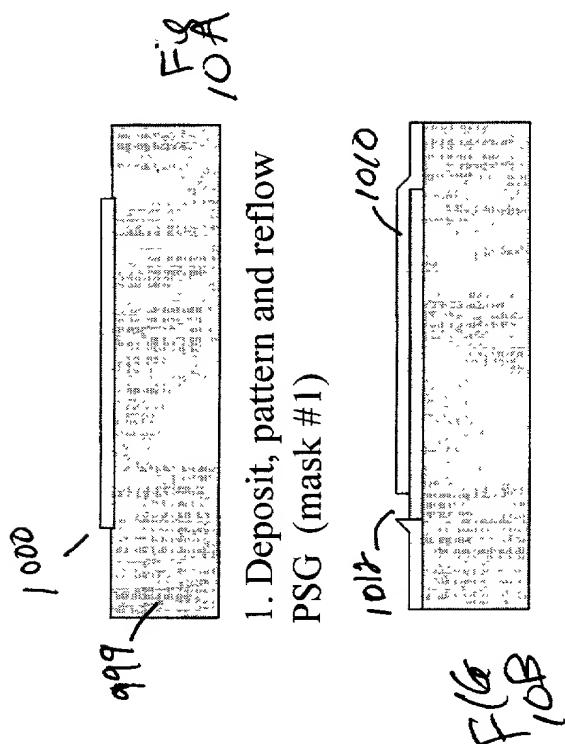
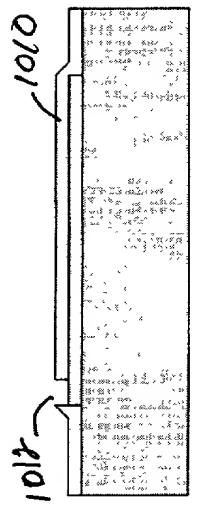


Fig. 9

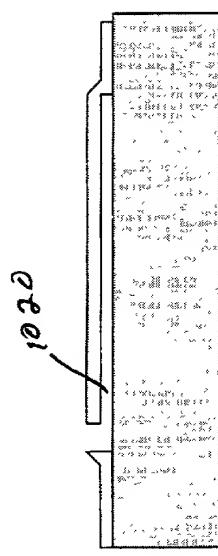
W C D D D C E E E E E E E



1. Deposit, pattern and reflow  
PSG (mask #1)

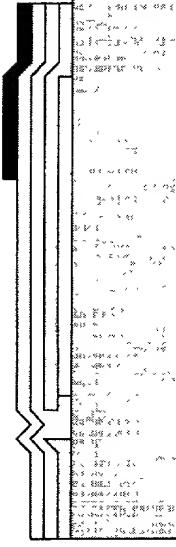


2. Deposit nitride and open etching holes  
(mask #2)

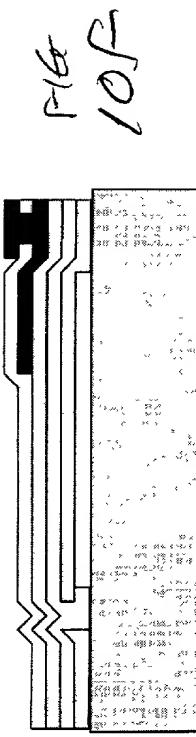


3. Removes PSG by concentrated HF

4. Deposit multi nitride layers



5. Deposit, dope and pattern poly  
(mask #3 and #4)



6. Deposit thin nitride ( 0.2  $\Omega$ m ), open  
contact holes, and Al metalization  
(mask #5 and #6)

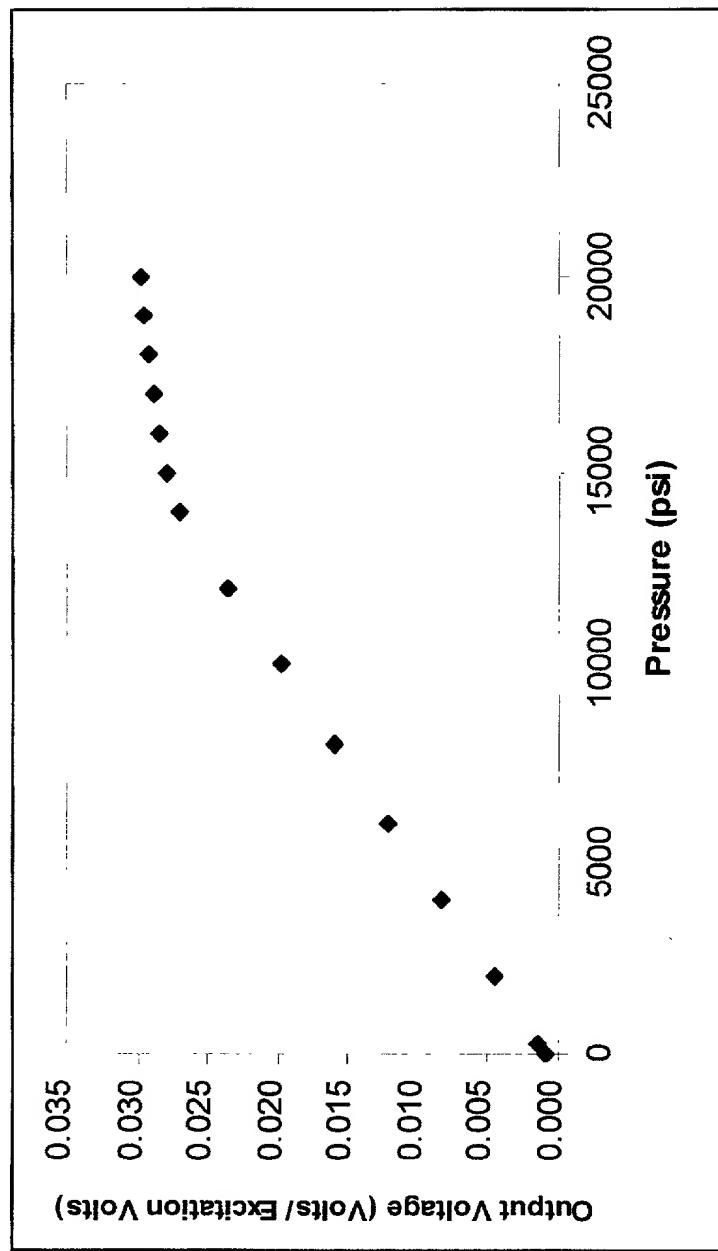
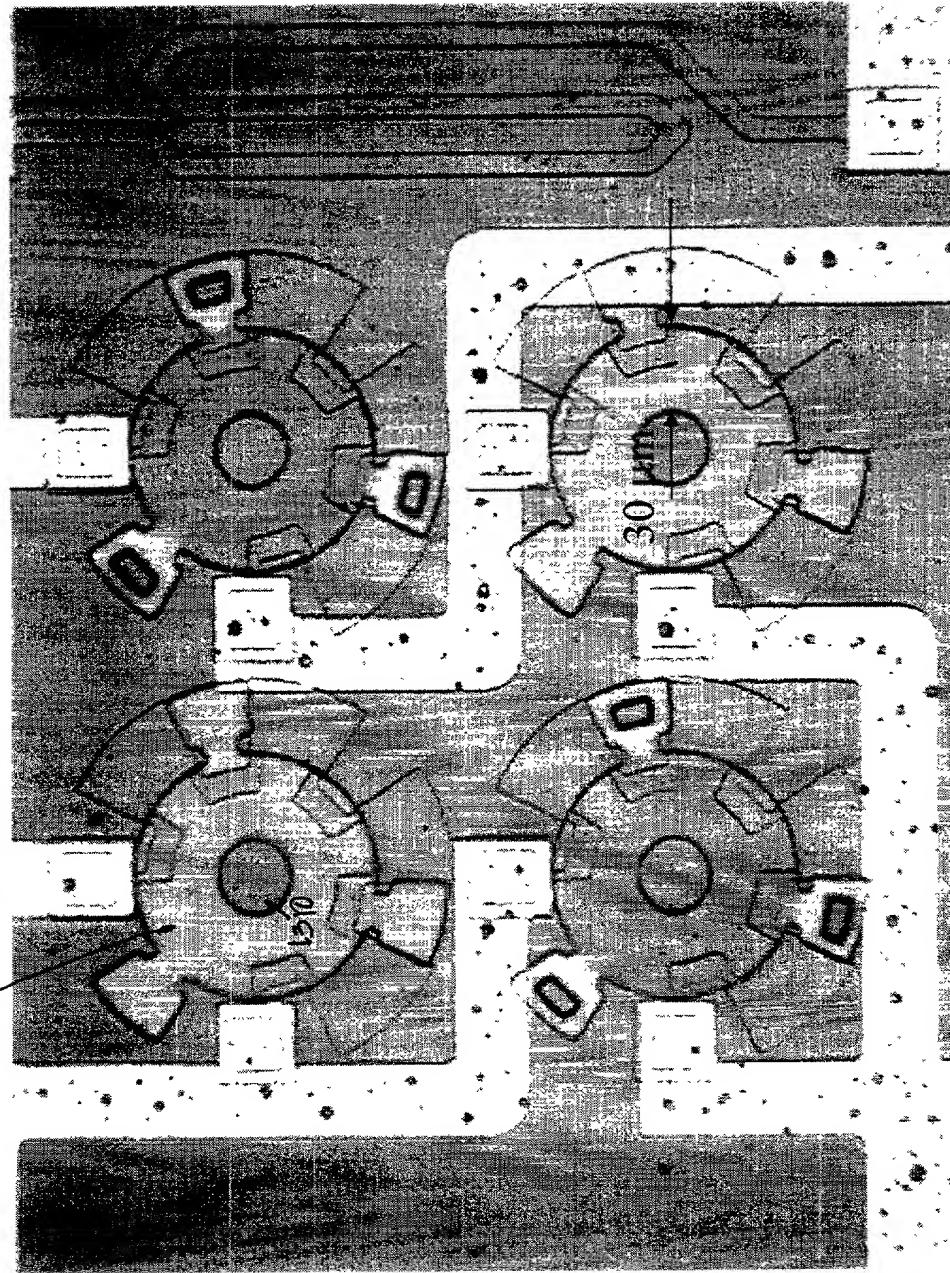


FIG. 11

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

105



F16  
10

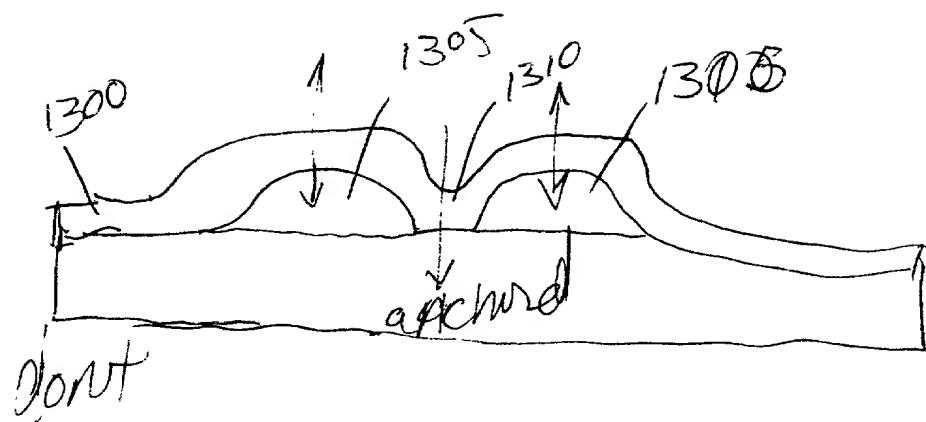


FIG 13